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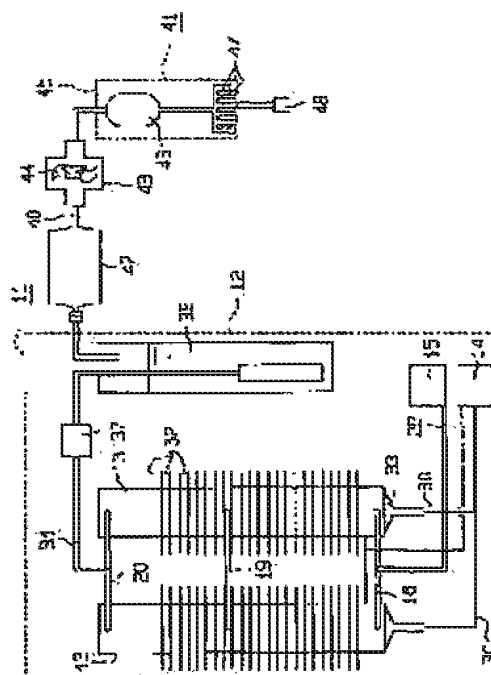
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(54) GASEOUS MIXTURE GENERATOR AND BOILER USING THE GASEOUS MIXTURE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a gaseous mixture generator by which a gaseous mixture uniformly mixed with a large quantity of gaseous hydrogen and gaseous oxygen can be obtained, and to provide a boiler using the gas generated thereby.

SOLUTION: The gaseous mixture generator consists of an apparatus body 11, a gas feed tube 40, a dehumidifier 42, a mixer 43 and a gaseous mixture distributor 41. Gaseous hydrogen and gaseous oxygen generated by electrolyzing water in an electrolytic cell 13 of the apparatus body 11 are dehumidified by the dehumidifier 42 to improve the purity thereof. After that, they are uniformly mixed by the mixture 43 into a gaseous mixture (brown gas) in which the ratio of hydrogen to oxygen is 2:1. Then, this gaseous mixture is fed so as to be diverged into a plurality of feed destinations by the gaseous mixture distributor 41.



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CLAIMS

[Claim(s)]

[Claim 1]A device main frame provided with two or more cells which accommodated in an inside an electrolysis cell formed from electrode tubes arranged at a pole bolt and its circumference is used. By an electrolyte's supplying in a cell an electrolysis solution mixed by water, and impressing positive or negative voltage to a pole bolt and an electrolysis cell, electrolyze water and hydrogen and oxygen gas are generated. A mixed gas generator which connected a mixer which mixes hydrogen and oxygen gas uniformly to a gas supply line, and generates mixed gas while sending this hydrogen and oxygen gas to a supply destination via a gas supply line connected to a device main frame.

[Claim 2]While a pivotable fan for mixing is formed in a field which intersects perpendicularly with an inside of said mixer to a direction of movement of hydrogen and oxygen gas and this fan for mixing rotates inside of a mixer vigor at the time of hydrogen and oxygen gas passing. The mixed gas generator according to claim 1 constituted so that hydrogen and oxygen gas might circle by rotation of a fan for mixing and it might be mixed uniformly.

[Claim 3]While connecting to said gas supply line a dehumidifier from which moisture contained in hydrogen and oxygen gas is removed. The mixed gas generator according to claim 1 or 2 constituted so that it might collide with a barrier and moisture in hydrogen and oxygen gas might be made to dew the surface, when a barrier prolonged in the direction which intersects an inside of a dehumidifier to a direction of movement of hydrogen and oxygen gas was allocated and hydrogen and oxygen gas passed through inside of a dehumidifier.

[Claim 4]A power supply unit which impresses voltage to said pole bolt and an electrolysis cell by having a polar conversion machine and changing by turns the polarity of voltage impressed to a pole bolt and an electrolysis cell, A generator of the mixed gas according to any one of claims 1 to 3 reversing the polarity of a pole bolt and an electrolysis cell every predetermined time.

[Claim 5]The mixed gas generator according to any one of claims 1 to 4 which provided a discharge part for discharging to the exterior an impurity generated at the time of electrolysis in a pars basilaris ossis occipitalis of said cell.

[Claim 6]The mixed gas generator according to any one of claims 1 to 5 provided with a boiler feeding device which supplies water automatically in a cell when an amount-of-water detector was formed in said cell and amount of water in a cell became below in the specified quantity.

[Claim 7]The mixed gas generator according to any one of claims 1 to 6 which unified all the cells by connecting said two or more cells in parallel with a communicating tube, respectively, and opening an inside of each cell for free passage.

[Claim 8]The mixed gas generator according to any one of claims 1 to 7 which equipped an end of said gas supply line with a mixed gas distributor which branches and supplies mixed gas to two or more supply destinations.

[Claim 9]The mixed gas generator according to any one of claims 1 to 8 supplying to a cell water obtained by purifying at least one which connects a purifying treatment part to said device main frame via a water supply pipe, and is chosen from industrial effluent, storm sewage, sea water, and sewage in this purifying treatment part.

[Claim 10]By attaching in a peripheral wall end of said electrode tubes a spacing member which makes the shape of a section U character, or inverted-L-shaped, and allocating two or more electrode tubes in concentric circle shape in the state where a spacing member intervenes between each. The mixed gas generator according to any one of claims 1 to 9 constituting so that each electrode tubes may become every regular intervals.

[Claim 11]A boiler apparatus constituted so that it might be made to burn in a combustion part by using as fuel mixed gas generated with the mixed gas generator according to any one of claims 1 to 10, boiler water accommodated in a boiler body via a heat exchanging part with combustion heat then produced might be heated and high-pressure steam might be obtained.

[Claim 12]While said heat exchanging part is a fire tube allocated in a boiler body, and constituting an inside of a fire tube so that boiler water of the exterior of a fire tube may be heated when flame produced when mixed gas burns passes. The boiler apparatus according to claim 11 which connected two or more division pipes, formed this fire tube, and has arranged a flame cone, an inner flame, and an outer flame of flame in each division pipe, respectively.

[Claim 13]The boiler apparatus according to claim 12 which formed a part of peripheral wall of said fire tube in bellows shape, and formed bellows.

[Claim 14]A boiler apparatus which is provided with the following, supplies boiler water to an inside of this boiler body from a water tube, and is characterized by constituting so that high-pressure steam may be obtained by making a phreatic explosion cause inside a boiler body while heating so that the inside may become more than prescribed temperature about a boiler body by said heating unit.

A boiler body which is a boiler apparatus which uses as fuel mixed gas generated with the mixed gas generator according to any one of claims 1 to 10, and makes the shape of a cylinder like object with base.

A water tube which supplies boiler water to an inside of this boiler body.

A combustion part which burns said mixed gas and generates combustion heat.

An evaporator which heats boiler water supplied in a boiler body with combustion heat from a combustion part, and is made into a steam.

[Claim 15] A boiler apparatus which uses as fuel mixed gas generated with the mixed gas generator according to any one of claims 1 to 10, comprising:

A boiler body which makes the shape of a cylinder like object with base.

A water tube which supplies boiler water to an inside of this boiler body.

A combustion part which burns said mixed gas and generates combustion heat.

An evaporator which heats boiler water supplied in a boiler body with combustion heat from a combustion part, and is made into a steam.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the boiler apparatus which uses the mixed gas generator which electrolyzes water and makes the mixed gas of the hydrogen gas used when a lot of combustible gas is needed like metal cutting, welding, and a boiler apparatus, and oxygen gas generate, and the mixed gas generated by that cause.

[0002]

[Description of the Prior Art]Conventionally, a pole bolt is inserted in the center of the electrode unit which arranges and formed the electrode tubes which make cylindrical shape on the same mind in the state where it was insulated mutually, as above mixed gas generators, and what uses the cell constituted by accommodating in a cylindrical body in this state is proposed. The electrolysis room is formed between each electrode tubes which constitute an electrode unit, and the electrolysis solution which consists of water and an electrolyte is stored by this electrolysis interior of a room. And in positive voltage, by carrying out the seal of approval of the negative voltage to an electrode unit, water is electrolyzed by the pole bolt and hydrogen gas from the negative pole is generated for oxygen gas from the anode. When the mixed gas generator which uses such a cell is used, electrolytic efficiency is high, the mixed gas of a lot of hydrogen and oxygen gas can be obtained, and these mixed gas is used for metal cutting, welding, a boiler apparatus, etc. as combustible gas.

[0003]

[Problem(s) to be Solved by the Invention]However, while the above-mentioned conventional mixed gas generator is connected to a supply destination for piping etc., hydrogen and oxygen gas are supplied to the supply destination via piping with the state where it was generated by the cell, and mixing of hydrogen and oxygen gas is performed within piping. For this reason, there were problems — hydrogen and oxygen gas which are occupied in mixed gas are not uniform, and the combustion heat which the flame burned and produced becomes unstable and makes mixed gas necessary cannot be obtained.

[0004]This invention is made paying attention to the problem which exists in such conventional technology. There is a place made into the purpose in providing the boiler device which uses the mixed gas generator which can obtain the mixed gas which mixed uniformly a lot of hydrogen and oxygen gas, and the gas generated by that cause.

[0005]

[Means for Solving the Problem]In order to attain the above-mentioned purpose, an invention of the mixed gas generator according to claim 1, A device main frame provided with two or more cells which accommodated in an inside an electrolysis cell formed from electrode tubes arranged at a pole bolt and its circumference is used, By an electrolyte's supplying in a cell an electrolysis solution mixed by water, and impressing positive or negative voltage to a pole bolt and an electrolysis cell, electrolyze water and hydrogen and oxygen gas are generated, While sending this hydrogen and oxygen gas to a supply destination via a gas supply line connected to a device main frame, a mixer which mixes hydrogen and oxygen gas uniformly to a gas supply line, and generates mixed gas is connected.

[0006]An invention of the mixed gas generator according to claim 2, When a pivotable fan for mixing is formed in the invention according to claim 1 in a field which intersects perpendicularly with an inside of said mixer to a direction of movement of hydrogen and oxygen gas and hydrogen and oxygen gas pass through inside of a mixer, While a fan for mixing rotates, it constitutes so that hydrogen and oxygen gas may circle by rotation of a fan for mixing and it may be mixed uniformly.

[0007]An invention of the mixed gas generator according to claim 3, While connecting to said gas supply line a dehumidifier from which moisture contained in hydrogen and oxygen gas is removed in the invention according to claim 1 or 2, When a barrier prolonged in the direction which intersects an inside of a dehumidifier to a direction of movement of hydrogen and oxygen gas is allocated and hydrogen and oxygen gas pass through inside of a dehumidifier, it collides with a barrier, and it constitutes so that moisture in hydrogen and oxygen gas may be made to dew the surface.

[0008]An invention of the mixed gas generator according to claim 4, By a power supply unit which impresses voltage to said pole bolt and an electrolysis cell having a polar conversion machine in the invention according to any one of claims 1 to 3, and changing by turns the polarity of voltage impressed to a pole bolt and an electrolysis cell, The polarity of a pole bolt and an electrolysis cell is reversed every predetermined time.

[0009]An invention of the mixed gas generator according to claim 5 provides a discharge part for discharging to the exterior an impurity generated at the time of electrolysis in a pars basilaris ossis occipitalis of said cell in the invention according to any one of claims 1 to 4.

[0010]In the invention according to any one of claims 1 to 5, an invention of the mixed gas generator according to claim 6 is provided with a boiler feeding device which supplies water automatically in a cell, when an amount-of-water detector is formed in said cell and amount of water in a cell becomes below in the specified quantity.

[0011]In the invention according to any one of claims 1 to 6, an invention of the mixed gas generator according to claim 7 is provided with a boiler feeding device which supplies water automatically in a cell, when an amount-of-water detector is formed in said cell and amount of water in a cell becomes below in the specified quantity.

[0012]An invention of the mixed gas generator according to claim 8 equips an end of said gas supply line with a mixed gas distributor which branches and supplies mixed gas to two or more supply destinations in the invention according to any one of claims 1 to 7.

[0013]An invention of the mixed gas generator according to claim 9, In the invention according to any one of claims 1 to 8, a purifying treatment part is connected to said device main frame via a water supply pipe, Water obtained by purifying at least one chosen from industrial effluent, storm sewage, sea water, and sewage in this purifying treatment part is supplied to a cell.

[0014]An invention of the mixed gas generator according to claim 10, In the invention according to any one of claims 1 to 9, a spacing member which makes the shape of a section U character or inverted-L-shaped is attached in a peripheral wall end of said electrode tubes, By allocating two or more electrode tubes in concentric circle shape in the state where a spacing member intervenes between each, it constitutes so that each electrode tubes may become every regular intervals.

[0015]An invention of the boiler apparatus according to claim 11 is burned in a combustion part by using as fuel mixed gas generated with the mixed gas generator according to any one of claims 1 to 10, Boiler water accommodated in a boiler body via a heat exchanging part in combustion heat then produced is heated, and it constitutes so that high-pressure steam may be obtained.

[0016]In the invention according to claim 11 an invention of the boiler apparatus according to claim 12, While said heat exchanging part is a fire tube allocated in a boiler body, and constituting an inside of a fire tube so that boiler water of the exterior of a fire tube may be heated when flame produced when mixed gas burns passes, Two or more division pipes are connected, this fire tube is formed, and a flame cone, an inner flame, and an outer flame of flame are arranged in each division pipe, respectively.

[0017]In the invention according to claim 11 or 12, an invention of the boiler apparatus according to claim 13 forms a part of peripheral wall of said fire tube in bellows shape, and forms bellows.

[0018]A boiler body which an invention of the boiler apparatus according to claim 14 is a boiler apparatus which uses as fuel mixed gas generated with the mixed gas generator according to any one of claims 1 to 10, and makes the shape of a cylinder like object with base, A water tube which supplies boiler water to an inside of this boiler body, and a combustion part which burns said mixed gas and generates combustion heat, While heating so that it may have a heat exchanging part which heats boiler water supplied in a boiler body with combustion heat from a combustion part, and is made into a steam and the inside may become more than prescribed temperature about a boiler body by said heating unit, Boiler water was supplied to an inside of this boiler body from a water tube, and by making a phreatic explosion cause inside a boiler body, it constituted so that high-pressure steam might be obtained.

[0019]A boiler body which an invention of the boiler apparatus according to claim 15 is a boiler apparatus which uses as fuel mixed gas generated with the mixed gas generator according to any one of claims 1 to 10, and makes the shape of a cylinder like object with base, While having a water tube which supplies boiler water to an inside of this boiler body, a combustion part which burns said mixed gas and generates combustion heat, and a heat exchanging part which heats boiler water supplied in a boiler body with combustion heat from a combustion part, and is made into a steam, A condenser tube for supplying a gas for cooling to an inside of said boiler body is formed, By dropping an inside of a boiler body until it reaches prescribed temperature, supplying boiler water to an inside of this boiler body from a water tube in this state, and evaporating boiler water with a gas for cooling, it constituted so that low-pressure steam might be obtained.

[0020]

[Embodiment of the Invention](A 1st embodiment) A 1st embodiment of this invention is hereafter described in detail based on a drawing.

[0021]Two or more cells 13 with which the device main frame 11 which constitutes a mixed gas generator electrolyzes the water with which the potassium hydrate was mixed as an electrolyte in the body casing 12 as shown in drawing 1 and drawing 3 (a) and (b), It has the power supply unit 14 which supplies the electric power for electrolysis, and the pump 15 as a boiler feeding device which supplies water in the cell 13.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]The key map showing a mixed gas generator.

[Drawing 2]The perspective view showing the device main frame of a mixed gas generator.

[Drawing 3]As for (a), (b) is a right sectional view showing a cell, and a sectional side elevation showing a cell.

[Drawing 4]The sectional view showing the boiler apparatus of a 1st embodiment.

[Drawing 5]The sectional view showing the boiler apparatus of a 2nd embodiment.

[Drawing 6]As for (a), (b) is a sectional view showing the boiler apparatus of another gestalt, and a sectional view showing the boiler apparatus of another gestalt.

[Drawing 7]As for the right sectional view showing the cell of another gestalt, and (b), in (a), (c) is the sectional side elevation which expanded the part which shows the cell of another gestalt, and a perspective view showing a spacing member.

[Description of Notations]

11 [— The pump as a boiler feeding device,] — A device main frame, 13 — A cell, 14 — A power supply unit, 15 16 — An electrolysis cell, 18 — The 1st communicating tube as a communicating tube, 19 — The 2nd communicating tube as a communicating tube, 20 [— Discharge part,] — The 3rd communicating tube as a communicating tube, 21 — A pole bolt, 23 — Electrode tubes, 33 40 [— A mixer, 44 / — The fan for mixing, 48 / — The burner as a combustion part, 49 / — A boiler body, 50 / — The fire tube as a heat exchanging part 66 / — Bellows, 71 / — A water tube, 75 / — Spacing member,] — A gas supply line, 41 — A mixed gas distributor, 42 — A dehumidifier, 43

[Translation done.]